

SEQUENCE LISTING

<110> Goshorn, Stephen C.
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Lin, Yakankg
Sanderson, James A.
Reno, Jonh M.

<120> STREPTAVIDIN EXPRESSED GENE FUSIONS AND
METHODS OF USE THEREOF

<130> 690022.547

<140> US
<141> 2000-06-05

<160> 46

<170> FastSEQ for Windows Version 4.0

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<212> DNA
<213> Streptomyces avidinii

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ctggtaaac cagctcggct cgacattcat cgtgaccggcg ggcggccgacg gcggccctgac
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gaagtccacg ctggccggcc acgacacctt caccaggta aagccgtccg ccgcctccat
cgacgcggcg aagaaggccg ggcgtcaacaa cggcaacccg ctcgacggcg ttcagcagta
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<213> Streptomyces avidinii

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Ser Ile Thr Ala Ser Ala Ser Ala Asp Pro Ser Lys Asp Ser Lys Ala
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Gln Val Ser Ala Ala Glu Ala Gly Ile Thr Gly Thr Trp Tyr Asn Gln
35 40 45
Leu Gly Ser Thr Phe Ile Val Thr Ala Gly Ala Asp Gly Ala Leu Thr

50	55	60
Gly	Thr	Tyr
Thr	Tyr	Glu
Gly	Ser	Ala
Asn	Val	Gly
Asn	Ala	Ale
Glu	Ser	Glu
Arg	Arg	Arg
Tyr	Tyr	Tyr
Asp	Ser	Asn
Ser	Ala	Pro
Ala	Pro	Ala
Thr	Asp	Asp
Gly	Ser	Gly
Thr	Gly	Thr
Trp	Trp	Trp
Leu	Val	Ala
Gly	Trp	Trp
Asn	Lys	Asn
Asn	Asn	Tyr
Tyr	Arg	Arg
Asn	Asn	Asn
Ala	His	Ser
His	Ser	
Leu	100	
Gly	105	
Trp	110	
Ala	115	
Thr	120	
Trp	125	
Leu	130	
Leu	135	
Thr	140	
Ser	145	
Gly	150	
Thr	155	
Leu	160	
Val		
Gly		
His		
Asp		
Thr		
Phe		
Thr		
Lys		
Val		
Lys		
Ala		
Ala		
Ser		
Ile		
Asp		
Ala		
Ala		
Lys		
Lys		
Ala		
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<212> DNA
<213> Streptomyces avidinii

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ccatcgaccc	ggacctcgac	catccagttc	tgccgc当地	gacacatgcc	gcactgctgt	180
ttgttcaccc	acaccgtcag	gtgcacggcc	gaggtcacaa	accttgacgg	gcgggatacg	240
gacggcgcac	gccacagcgc	gccctccgtc	cccggccggc	aacaactagg	gagttttttt	300
cgtgtctcac	atgcgaaga	tcgtcggtgc	agccatcgcc	gtttccctga	ccacggcttc	360
gattacggcc	atggctgaca	tccagatgac	tcagtctcca	tcgtccttgc	ctgcctctgt	420
gggagacaga	gtcacatca	cttgcgggc	tagtcaggc	attagaggt	atttagactg	480
gtatcagcag	aaacctggta	agggaccgaa	actcttaatc	tactccacat	ccaatttaaa	540
ttctgggtgc	ccatcaaggt	tcagtgccag	tgggtctggg	tcagattata	ctctcaccat	600
cagcagcctt	cagcctgaag	atttcgcaac	gtattactgt	ctacagcgt	atgcgtatcc	660
gtacacgttc	ggacaaggga	ccaagctgga	gatcaagatc	tctggtgccg	gtggctcggg	720
cgggtgtggg	tcgggtggcg	gaggctcgag	ccaggttcag	ctggtccagt	ctggggcaga	780
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cggctcgacc	ttcatcgta	ccgcggggcc	cgacggcc	ctgaccggaa	cctacgagtc	1260
ggccgtcgcc	aacgcgaga	ggcgtacgt	cctgaccgg	cgttacgaca	gccccccggc	1320
caccgacggc	agcggcaccg	ccctcggtt	gacgtggcc	tggaagaata	actaccgcaa	1380
cggccactcc	gegaccacgt	ggagcggcca	gtacgtcgcc	ggcggccgagg	cgaggatcaa	1440
cacccagtgg	ctgctgaccc	ccggcaccac	cgagccaaac	gccttggaa	ccacgctgg	1500
cggccacgac	accttcacca	aggtgaagcc	gtccggcc	tccatcgacg	cgggcgaagaa	1560
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<210> 4
<211> 431

<212> PRT

<213> *Streptomyces avidinii*

<400> 4

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 20 25 30
 Leu Ser Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser
 35 40 45
 Gln Gly Ile Arg Gly Asn Leu Asp Trp Tyr Gln Gln Lys Pro Gly Lys
 50 55 60
 Gly Pro Lys Leu Leu Ile Tyr Ser Thr Ser Asn Leu Asn Ser Gly Val
 65 70 75 80
 Pro Ser Arg Phe Ser Gly Ser Gly Ser Asp Tyr Thr Leu Thr
 85 90 95
 Ile Ser Ser Leu Gln Pro Glu Asp Phe Ala Thr Tyr Tyr Cys Leu Gln
 100 105 110
 Arg Asn Ala Tyr Pro Tyr Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile
 115 120 125
 Lys Ile Ser Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly
 130 135 140
 Gly Ser Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys
 145 150 155 160
 Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Phe Asn Ile
 165 170 175
 Lys Asp Thr Tyr Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu
 180 185 190
 Gln Trp Met Gly Arg Ile Asp Pro Ala Asn Gly Asn Thr Lys Ser Asp
 195 200 205
 Leu Ser Phe Gln Gly Arg Val Thr Ile Thr Ala Asp Thr Ser Ile Asn
 210 215 220
 Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val
 225 230 235 240
 Tyr Tyr Cys Ser Arg Glu Val Leu Thr Gly Thr Trp Ser Leu Asp Tyr
 245 250 255
 Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly Ser Gly Ser Ala
 260 265 270
 Asp Pro Ser Lys Asp Ser Lys Ala Gln Val Ser Ala Ala Glu Ala Gly
 275 280 285
 Ile Thr Gly Thr Trp Tyr Asn Gln Leu Gly Ser Thr Phe Ile Val Thr
 290 295 300
 Ala Gly Ala Asp Gly Ala Leu Thr Gly Thr Tyr Glu Ser Ala Val Gly
 305 310 315 320
 Asn Ala Glu Ser Arg Tyr Val Leu Thr Gly Arg Tyr Asp Ser Ala Pro
 325 330 335
 Ala Thr Asp Gly Ser Gly Thr Ala Leu Gly Trp Thr Val Ala Trp Lys
 340 345 350
 Asn Asn Tyr Arg Asn Ala His Ser Ala Thr Thr Trp Ser Gly Gln Tyr
 355 360 365
 Val Gly Gly Ala Glu Ala Arg Ile Asn Thr Gln Trp Leu Leu Thr Ser
 370 375 380
 Gly Thr Thr Glu Ala Asn Ala Trp Lys Ser Thr Leu Val Gly His Asp
 385 390 395 400

Thr Phe Thr Lys Val Lys Pro Ser Ala Ala Ser Ile Asp Ala Ala Lys
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Lys Ala Gly Val Asn Asn Gly Asn Pro Leu Asp Ala Val Gln Gln
 420 425 430

<210> 5

<211> 1239

<212> DNA

<213> Streptomyces avidinii

<400> 5

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tctctccccca aaccctggat ttatgccaca tccaacctgg	cttctggagt ccctgctcgc	180
ttcagtgcca gtgggtctgg gacctttac tcttcacaa	tcagcagagt ggaggctgaa	240
gatgctgcca cttattactg ccagcagttgg attagtaacc	cacccacgtt cggtgctggg	300
accaagctgg agctgaagat ctctggctcg gaaggcagcc	cggaagcagg tctgtctccg	360
gacgcagggtt cggcgtcgag ccagggttcag ctggtccagt	caggggctga gctgttgaag	420
cctggggccct cagtgaagat gtcctgcaag gcttctggct	acacattttac cagttacaat	480
atgcactggg taaagcagac acctggacag ggcctggaaat	ggattggagc tatttatcca	540
ggaaatgggt atacttccta caatcagaag ttcaaaggca	aggccacatt gactgcagac	600
aaatcctcca gcacagccta catgcagctc agcagcctga	catctgagga ctctgcggtc	660
tattactgtg caagagcgcata attacgacct aactactgg	acttcgatgt ctggggcgcac	720
gggaccacgg tcaccgtgag ctctggctct gggtcggcag	accccctccaa ggactcgaag	780
gcccgaggctc cggcccccga gcgcggcatc accggcacct	ggtacaacca gctcggctcg	840
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ggcaacgccc agagccgcta cgtcctgacc ggtcggttacg	acagcgcaccc ggccacccgac	960
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tccgcgacca cgtggagcgg ccagtacgtc ggccggcccg	aggcgaggat caacaccccg	1080
tggctgctga cctccggcac caccgaggcc aacgcctggaa	agtccacgct ggtggccac	1140
gacacccatcg ccaaggtaa ggcgtccggccgcctccatcg	acgcggcgaa gaaggccggc	1200
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<210> 6

<211> 412

<212> PRT

<213> Streptomyces avidinii

<400> 6

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Glu Lys Val Thr Met Thr Cys Arg Ala Ser Ser Ser Val Ser Tyr Met		
20 25 30		
His Trp Tyr Gln Gln Lys Pro Gly Ser Ser Pro Lys Pro Trp Ile Tyr		
35 40 45		
Ala Thr Ser Asn Leu Ala Ser Gly Val Pro Ala Arg Phe Ser Gly Ser		
50 55 60		
Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile Ser Arg Val Glu Ala Glu		
65 70 75 80		
Asp Ala Ala Thr Tyr Tyr Cys Gln Gln Trp Ile Ser Asn Pro Pro Thr		
85 90 95		
Phe Gly Ala Gly Thr Lys Leu Glu Leu Lys Ile Ser Gly Leu Glu Gly		
100 105 110		
Ser Pro Glu Ala Gly Leu Ser Pro Asp Ala Gly Ser Gly Ser Ser Gln		

115	120	125
Val Gln Leu Val Gln Ser Gly Ala Glu Leu Val Lys Pro Gly Ala Ser		
130	135	140
Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr Asn		
145	150	155
Met His Trp Val Lys Gln Thr Pro Gly Gln Gly Leu Glu Trp Ile Gly		160
165	170	175
Ala Ile Tyr Pro Gly Asn Gly Asp Thr Ser Tyr Asn Gln Lys Phe Lys		
180	185	190
Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr Met		
195	200	205
Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys Ala		
210	215	220
Arg Ala Gln Leu Arg Pro Asn Tyr Trp Tyr Phe Asp Val Trp Gly Ala		
225	230	235
Gly Thr Thr Val Thr Val Ser Ser Gly Ser Gly Ser Ala Asp Pro Ser		240
245	250	255
Lys Asp Ser Lys Ala Gln Val Ser Ala Ala Glu Ala Gly Ile Thr Gly		
260	265	270
Thr Trp Tyr Asn Gln Leu Gly Ser Thr Phe Ile Val Thr Ala Gly Ala		
275	280	285
Asp Gly Ala Leu Thr Gly Thr Tyr Glu Ser Ala Val Gly Asn Ala Glu		
290	295	300
Ser Arg Tyr Val Leu Thr Gly Arg Tyr Asp Ser Ala Pro Ala Thr Asp		
305	310	315
Gly Ser Gly Thr Ala Leu Gly Trp Thr Val Ala Trp Lys Asn Asn Tyr		320
325	330	335
Arg Asn Ala His Ser Ala Thr Thr Trp Ser Gly Gln Tyr Val Gly Gly		
340	345	350
Ala Glu Ala Arg Ile Asn Thr Gln Trp Leu Leu Thr Ser Gly Thr Thr		
355	360	365
Glu Ala Asn Ala Trp Lys Ser Thr Leu Val Gly His Asp Thr Phe Thr		
370	375	380
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<210> 7
<211> 1280
<212> DNA
<213> Streptomyces avidinii

<400> 7

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agcagacacc tggacagggc ctggaatgga ttggagctat ttatccagga aatggtgata	180
cttcctacaa tcagaagttc aaaggcaagg ccacattgac tgcagacaaa tcctccagca	240
cagcctacat gcagctcagc agcctgacat ctgaggactc tgcggcttat tactgtgcaa	300
gagcgcaatt acgacctaac tactggtaact tcgatgtctg gggcgccagg accacggta	360
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taagttacat gcactggtaa caggatcctc ccccaaacc cggattatg	600

ccacatccaa cctggttct ggagtccctg ctcgcttcag tggcagtggg tctggacct	660
cttactctct cacaatcagc agagtggagg ctgaagatgc tgccacttat tactgccagc	720
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gctctggttc ggcagacccc tccaaggact cgaaggccca ggtctcgcc gccgaggccg	840
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tgaccggctcg ttacgacagc gccccggcca ccgacggcag cggcaccgcc ctcgggttgg	1020
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ccgttcagca gtaaggatcc	1280

<210> 8
<211> 423
<212> PRT
<213> Streptomyces avidinii

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35 40 45	
Trp Ile Gly Ala Ile Tyr Pro Gly Asn Gly Asp Thr Ser Tyr Asn Gln	
50 55 60	
Lys Phe Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr	
65 70 75 80	
Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr	
85 90 95	
Tyr Cys Ala Arg Ala Gln Leu Arg Pro Asn Tyr Trp Tyr Phe Asp Val	
100 105 110	
Trp Gly Ala Gly Thr Thr Val Thr Val Ser Lys Ile Ser Gly Gly Gly	
115 120 125	
Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Gly	
130 135 140	
Ser Gly Gly Gly Ser Ser Asp Ile Val Leu Ser Gln Ser Pro Ala	
145 150 155 160	
Ile Leu Ser Ala Ser Pro Gly Glu Lys Val Thr Met Thr Cys Arg Ala	
165 170 175	
Ser Ser Ser Val Ser Tyr Met His Trp Tyr Gln Gln Lys Pro Gly Ser	
180 185 190	
Ser Pro Lys Pro Trp Ile Tyr Ala Thr Ser Asn Leu Ala Ser Gly Val	
195 200 205	
Pro Ala Arg Phe Ser Gly Ser Gly Ser Gly Thr Ser Tyr Ser Leu Thr	
210 215 220	
Ile Ser Arg Val Glu Ala Glu Asp Ala Ala Thr Tyr Tyr Cys Gln Gln	
225 230 235 240	
Trp Ile Ser Asn Pro Pro Thr Phe Gly Ala Gly Thr Lys Leu Glu Leu	
245 250 255	
Lys Ser Ser Gly Ser Gly Ser Ala Asp Pro Ser Lys Asp Ser Lys Ala	
260 265 270	
Gln Val Ser Ala Ala Glu Ala Gly Ile Thr Gly Thr Trp Tyr Asn Gln	

275	280	285
Leu	Gly	Ser
Thr	Phe	Ile
Ile	Val	Thr
Gly	Ala	Gly
Asp	Ala	Gly
Ala	Leu	Thr
290	295	300
Gly	Thr	Tyr
Glu	Ser	Ala
Val	Gly	Asn
Ala	Glu	Ser
Arg	Tyr	Val
305	310	315
Thr	Gly	Leu
Arg	Asp	Tyr
Tyr	Ser	Ala
Asp	Pro	Ala
Ser	Thr	Asp
325	330	335
Leu	Gly	Gly
Gly	Trp	Thr
Trp	Val	Ala
Lys	Asn	Asn
Asn	Tyr	Arg
Tyr	Asn	Ala
Asn	His	Ser
340	345	350
Ala	Thr	Thr
Trp	Ser	Gly
Gly	Gln	Tyr
Tyr	Val	Gly
Gly	Ala	Glu
Ala	Arg	Ile
355	360	365
Asn	Thr	Gln
Trp	Leu	Leu
Leu	Thr	Ser
Gly	Thr	Thr
Glu	Ala	Asn
Ala	Asn	Ala
Trp	370	375
Lys	Ser	Thr
Thr	Leu	Val
Gly	His	Asp
Asp	Thr	Phe
Thr	Phe	Thr
Lys	Val	Lys
Val	Lys	Pro
Lys	405	410
Ala	Ala	Ser
Ile	Asp	Ala
Ala	Lys	Lys
Lys	Ala	Gly
Ala	Val	Val
Asn	Asn	Asn
Asn	415	415
Pro	Leu	Asp
Asp	Ala	Val
Ala	Gln	Gln
420		

<210> 9
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> pKOD linker

<400> 9
Gly Leu Glu Gly Ser Pro Glu Ala Gly Leu Ser Pro Asp Ala Gly Ser
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Gly Ser

<210> 10
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Linker used to create a scFvSA version of
anti-CD20mAb, B9E9 in the VLVH orientation

<400> 10
Gly Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser
1 5 10 15

<210> 11
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Linker used to create a version of B9E9 scFvSA in

the VHVL orientation

<400> 11
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 1 5 10 15
 Gly Gly Gly Ser Gly Gly Gly Ser
 20 25

<210> 12
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 12
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32

<210> 13
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 13
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31

<210> 14
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 14
tagctggcgg ccgcccgtt gaagctcttg acaat

35

<210> 15
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 15
tagctggcgg ccgctttctt gtccaccttg gtgc

34

<210> 16
<211> 47

<212> DNA		
<213> Artificial Sequence		
<220>		
<223> Oligonucleotide primer		
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<211> 32		
<212> DNA		
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caccagagat cttcagctcc agcttggtcc ca		32
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<211> 52		
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<223> Oligonucleotide primer		
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cgaggaggctcg agccaggttc agctggtcca gtcaggggct gagctggtga ag		52
<210> 19		
<211> 38		
<212> DNA		
<213> Artificial Sequence		
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<223> Oligonucleotide primer		
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gagccagagc tcacggtgac cgtggtccct gcgccccca		38
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<212> DNA		
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<223> Oligonucleotide primer		
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<211> 58
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

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<210> 22
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

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<210> 23
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 23
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<210> 24
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

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<210> 25
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer

<400> 25
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<210> 26
 <211> 35
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Oligonucleotide primer

<400> 26
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<210> 27
 <211> 79
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Oligonucleotide primer

<400> 27
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 tgggtcggtt ggcggccggc 79

<210> 28
 <211> 79
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Oligonucleotide primer

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 ccgagccacc gccaccaga 79

<210> 29
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Linker sequence

<400> 29
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 1 5 10 15
 Gly Ser

<210> 30
 <211> 35
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Linker sequence

<400> 30

Gly Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser Gly
1 5 10 15
Gly Gly Gly Ser Gly Gly Ser Gly Gly Gly Ser Gly Gly
20 25 30
Gly Gly Ser
35

<210> 31

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Linker sequence pKOD2

<400> 31

Gly Leu Glu Gly Ser Pro Glu Ala Gly Leu Ser Pro Asp Ala Gly Ser
1 5 10 15
Asp Ser

<210> 32

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 32

acgacggttt ctgcggcggt c

21

<210> 33

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 33

aggctcattt atgatgcggg t

21

<210> 34

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 34		
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<210> 35		
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ctcgagaagc tttaactaaa ttaatacagc gga		33
<210> 36		
<211> 783		
<212> DNA		
<213> Streptomyces avidinii		
<400> 36		
gagggttcagc tgca...cagtttgcgtt cttgtggagg cggggccccc agtcaagttt	60	
tcctgcacag cttctggctt caacattaa gacacctata tgcactgggt gaagcagagg	120	
cctgaacagg gcctgaaatg gattggaaagg attgatccctg cgaatggtaa tagtaaatat	180	
gtccccgaagt tccaggggcaa ggccactata acaggagaca catcctccaa cacagcctac	240	
ctgcagctca ccagcctgac atctgaggac actgccgtct attattgtgc tccgttttgt	300	
tactacgtgt ctgactatgc tatggcctac tggggtcaag gAACCTCAAG caccgtctcc	360	
tcaaaagatct ctgggtggcg tggctcg...ggc ggtgtgggt cgggtggcg cggctcggtt	420	
gggtgtgggt cggggggcg cggctcgagc gacattgtgc tgacccaatc tccagcttct	480	
ttggctgtgt ctcttggca gagggccact atgtcctgca gagccggta aagtgttcat	540	
atttttggcg ttgggtttt gca...ctggta cagcagaaac caggacagcc acccaaactc	600	
ctcatctatc gtgcattccaa cctagaatct gggatccctg tcaggttcag tggca...tgg	660	
tctaggacag acttcaccct catcattgtat cctgtggagg ctgtatgt tgccacctat	720	
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aag	783	
<210> 37		
<211> 786		
<212> DNA		
<213> Streptomyces avidinii		
<400> 37		
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tcctgcaccc cttctggctt caacattaa gattactata tgcattgggt gaaacagcgt	120	
ccggaaacagg gcctgaaatg gattgggtgg attgatccgg aaaatggtaa taccgaatat	180	
gccccgaaat tccaggggcaa agccacgtg accaccgata cctcctccaa cacccctac	240	
ctgcagctca gcagcctgac ctctgaagat accggccgtct attactgtaa taccgttgtt	300	
ctatctacca tgattacgac gcggtgggtc ttcatgtgtt gggggcgcagg gaccacggc	360	
accgtctcca agatctctgg tggcggtggc tggggcggtg gtgggtcg...gg tggcggtggc	420	
tggggtgggt g...gggtcg...gg cggcggtggc tcgagcgata ttgtgtcgac ccagtctccg	480	
gtttccttaa ccgtatctt ggggtctgcgt gccaccatct catgcccgtgc cagaaaaagt	540	
gtcagtgcattt ctggctatag ttatatgcattt tggtaccaac agcgccggg tcagccgccc	600	
aaactcttca tctatcttgc atccaaccta caatctggt tcccgcccg tttcgtggc	660	
agtgggtctg ggaccgattt caccctcaac atccatccgg tggaagaaga agatgtgc	720	

acctattact gtcagcatag tcgtgaactt ccgacgttcg gtggtggcac caaactggaa	780
atcaag	786

<210> 38
<211> 771
<212> DNA
<213> Streptomyces avidinii

<400> 38	
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agctgcaagg cttctggta tacttcacc gtgttggta tgaactgggt gaagcaggct	120
ccgggcaagg gttaaagtg gatgggctgg attaacacca aaactggtga agcaacctat	180
gttgaagagt ttaagggtcg ctttgccctc tcttggaga cctctgcac cactgcctat	240
ttgcagatca acaacctcaa aatgaggac acggctaaat atttctgtgc acgttggac	300
tcttatgatt acgtgaagc tatggattac tgggc当地 ggaccacggt caccgtctcc	360
aagatctctg gtggc当地 ggctcgat ggtgggtcg gtggc当地 ggctcgat ggtgggtcg	420
gtggc当地 ggctcgat ggtgggtcg atgtgatga cccagtctca acgttcatg	480
tccacttc当地 taggtgatcg tgc当地 ggatcg acctgcaag ccagtctca tgggttacg	540
aatgttgc当地 ggtatcaaca gaaaccgggt caatccccga aagcactgtat ttactc当地 ggca	600
tcttaccgtt acagtgggtt cccggatc当地 ttc当地 accggca gtggtgc当地 gaccgattt	660
acgctc当地 accca tc当地 agcaatgt acagtctgaa gactggc当地 agtatttctg tcatcaatata	720
tacacctatc cgatttccac gttc当地 ggctcgat gggaccaatg tggaaatgaa g	771

<210> 39
<211> 762
<212> DNA
<213> Streptomyces avidinii

<400> 39	
caggtgaaac tgcagcagtc tgggtgc当地 cttgtgc当地 caggacatc agtcaaattt	60
tctgc当地 acccg cttctggctt caacattaa gattctata tgc当地 atttgc当地 gc当地 gaggg	120
ccggAACAGG gc当地 tggatg gattgggtgg atttgc当地 agaatgggtga tactgaat	180
gcaccgaatg tccaggccaa agccacctt actaccgata cctc当地 ctccaa caccgc当地 tac	240
ctgc当地 agtca gc当地 accgtc当地 ctctgaaatg actggc当地 tcttgc当地 attattgtaa tgaaggact	300
ccgactggtc cgtactactt tgattactgg ggtcaaggga ccacggtc当地 cgtctccaa	360
atctctggtg gccc当地 ggctc当地 gggc当地 gggtggctc gggc当地 gggtggctc gggc当地 gggtggctc	420
gggtc当地 gggtggctc gggc当地 gggtggctc gggc当地 gggtggctc gggc当地 gggtggctc	480
gc当地 atctccgg gtagaaaatg caccattacc tgc当地 agtgc当地 gctcaatgtt aagttat	540
cattggttcc agcagaaaacc gggtaacttcc cggaaacttcc ggatttatacg caccctccaa	600
ctggcttctg gtgttccggc tgc当地 ttccgtt ggc当地 agtgc当地 gctggacatc ttactcttc	660
accatcagcc gtaggaaatg tgaagatgtt gcaacttatt actgccagca acgtatgtt	720
tatccgctca cgatttccac gttc当地 ggctcgat gggaccaatg tggaaatgaa g	762

<210> 40
<211> 765
<212> DNA
<213> Streptomyces avidinii

<400> 40	
caggtccaac tacagcagtc agggggagac ttatgtgaagc ctggagggtc cctaaaattt	60
tccctgtgc当地 cctctggatt cc当地 ttccat cgctatgc当地 tgc当地 ttgggtt tgc当地 gagact	120
ccagagaaga ggctggatgt gtc当地 gatcc attatgtatgtt atggatgc当地 ctactatgc当地	180
gacagtgtga agggccgatt caccatctcc agagataatg ccaggaacat cctgtaccta	240
caaatgagca gtctgagggtc tgaggacacg gcaatgttatt actgtgc当地 agtatttattac	300

tacggtagta	gttactttga	ctactgggc	caagggacca	cggtcaccgt	gagcaagatc	360
tctgggtggcg	gtggctcggg	cggtgggtgg	tcgggtggcg	gcggctcggg	tgggtgggtgg	420
tctggcggcg	gcggctcggag	cgacatccag	atgactcagt	ctccaaaatt	catgcccaca	480
tcaagttaggaa	acagggtcag	cgtcacctgc	aaggccagtc	agaatgcggg	tactaatgt	540
gcctggtata	aacagaaaacc	agggcaatct	cctaaagcac	tgatTTactc	ggcatcgct	600
cggaacagtg	gagtccctga	tcgcttcaca	ggcagtggt	ctgggacaga	tttcaactctc	660
accatcagca	atgtcagtc	tgaagacttgc	gcagagtatt	tctgtcagca	atataacagc	720
tatcctctgg	tcacgttcgg	tgctgggacc	aagctggaaa	taaag		765

<210> 41

<211> 768

<212> DNA

<213> Streptomyces avidinii

<400> 41

caaggttcagt	tgcagcagtc	tgatgctgaa	ttggtgaaac	cgggtgcctc	agtaaaaatt	60
tcctgcaaag	cttctggcta	cacccatcacc	gatcatgcaa	ttcattgggt	gaaacagaac	120
ccggAACAGG	gccttggaaatg	gattggttat	ttctctccgg	gtaatgatga	tttcaaatac	180
aatgaacgtt	tcaaaggcaa	agccacgctg	accgcagata	aatcctccag	caccgcctac	240
gtgcagctca	acagcctgac	gtctgaagat	tctgcagtg	atttctgtac	gcgttccctg	300
aatatggcct	actggggtca	aggttacctca	gtcacccgtct	ccaagatctc	tgggtggcgt	360
ggctcgccgcg	gtgggtggc	gggtggcgcgc	ggctcgccgt	gtgggtggc	ggcggcggc	420
ggctcgagcg	atatttgc	gtcacagtc	ccgttctccc	taccgggtc	agttggcga	480
aaagttacct	tgagctgcaa	atccagtcag	agccttttat	atagtggtaa	tcagaaaaac	540
tacttggcct	ggtaccagca	aaaaccgggt	cagtctccga	aactgctgat	ttactggc	600
tcggctcggt	aatctgggtt	cccgatcgc	ttcacccggca	gtggttctgg	gaccgatttc	660
accctctcca	tcagcagtc	aaaaaccgaa	gacctggcag	tttattactg	tcagcagtg	720
tatagctatc	cgctcacgtt	cggtgctggg	accaaactgg	tgctgaag		768

<210> 42

<211> 765

<212> DNA

<213> Streptomyces avidinii

<400> 42

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tcttgtctg	cttctggctt	cacccatagt	gatgcctgga	tggattgggt	ccggcagtc	120
ccggagaaaag	ggcttgaatg	gtttgctgaa	attcgtaaca	aagccaataa	tcatggtacc	180
tattatgatg	agtctgtgaa	agggcgctc	accatctcac	gtgtatggatc	aaaaagtcgt	240
gtgtacctgc	aatatgattag	tttacgtgct	gaagataccg	ggcttttatta	ctgtaccggg	300
gaatttgc	actggggcca	ggggacgctg	gtcacccgtct	ctaagatctc	tgggtggcgt	360
ggctcgccgcg	gtgggtggc	gggtggcgcgc	ggctcgccgt	gtgggtggc	ggcggcggc	420
ggctcgagcg	atgttgtat	gacccaaact	ccgctctccc	tgccggc	tcttgtat	480
caagcttcca	tctctggcc	ttcttagtca	aaccttgcac	ataacaatgg	taacacccat	540
ttatatttgtt	tcctgcagaa	atcaggccag	tctccgaaac	tgctgat	tcgcgcatcc	600
atcccgcttt	ctgggtgtccc	gatcgctc	agtggcagtg	gttcagaaac	cgatttcacg	660
ctcaagatca	gccgtgtgaa	agctgaagac	ctgggtgttt	atttctgtt	tcaaggtacg	720
catgttccgt	ggacgttcgg	ttgtggcacc	aaactggaaa	tcaag		765

<210> 43

<211> 741

<212> DNA

<213> Streptomyces avidinii

<400> 43

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acctgttccg	tcactggta	ctccatca	actgattact	ggggctggat	ccgaaagtcc	120
ccagggaaata	aatggagtg	gatgggatac	ataagctaca	gtggtagcac	tggctacaac	180
ccatctctca	aaagtcaat	ctccattact	agagacacat	cgaagagtca	gttcttcctg	240
cagttgaact	ctgttaactac	tgaggacaca	gccacatatt	actgtgcaag	atacagtagc	300
cttgattact	ggggccgagg	agtcatggc	gcagtctcca	agatctctgg	tggcggtggc	360
tcgggcccgtg	gtgggtcggg	tggcggcggc	tcgggtggtg	gtgggtcggg	cggcggcggc	420
tcgagcgatg	ttgtgatgac	ccagacacca	ccgtctttgt	cgggtccat	tggacaatca	480
gtctccatct	cttgcaagtc	aagtcaagc	ctcgatata	gtgatggaaa	gacatatttg	540
cattggttat	tacagagtcc	tggcaggctt	ccgaagcgcc	taatctatca	ggtgtctaatt	600
ctgggctctg	gagtccctga	caggttca	ggcactggat	cacagaaaga	ttttacactt	660
aaaatcaga	gagtggaggc	tgaggatttg	ggagttact	actgcgcgca	aactacacat	720
tttcctctca	cgttcggttc	g				741

<210> 44

<211> 765

<212> DNA

<213> Streptomyces avidinii

<400> 44

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tcctgcaagg	tttctggcta	cacatttacc	agttacaata	tgcactgggt	aaagcagaca	120
cctggacagg	gcctgaaatg	gattggagct	atttatccag	gaaatggta	tacttcctac	180
aatcagaagt	tcaaaggcaa	ggccacattt	actgcagaca	aatcctccag	cacagcctac	240
atgcagctca	gcagcctgac	atctgaggac	tctcggtct	attactgtgc	aagagcgcaa	300
ttacgaccta	actactggta	tttcgatgtc	tggggcgcag	ggaccacggt	caccgtgagc	360
aagatctctg	gtggcggtgg	ctcgccggt	ggtgggtcgg	gtggcggcgg	ctcggtgggt	420
ggtgggtcgg	gccccggcgg	ctcgagcgac	atcggtctgt	cgcagtcctc	agcaatcctg	480
tctgcatctc	cagggagaa	ggtcacaatg	acttgcaggg	ccagctcaag	tgttaagttac	540
atgcacttgtt	accagcagaa	gccaggatcc	tccccaaac	cctggattta	tgcacatcc	600
aacctggctt	ctggagttccc	tgctcgctc	agtggcagtg	ggtctggac	ctcttactct	660
ctcacaatca	gcagagtgg	ggctgaagat	gctgccactt	attactgcca	gcagtggatt	720
agtaacccac	ccacgttcgg	tgctggacc	aagctggagc	tgaag		765

<210> 45

<211> 765

<212> DNA

<213> Streptomyces avidinii

<400> 45

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tcctgcaagg	tttctggcta	cacatttacc	agttacaata	tgcactgggt	aaagcagaca	120
cctggacagg	gcctgaaatg	gattggagct	atttatccag	gaaatggta	tacttcctac	180
aatcagaagt	tcaaaggcaa	ggccacattt	actgcagaca	aatcctccag	cacagcctac	240
atgcagctca	gcagcctgac	atctgaggac	tctcggtct	attactgtgc	aagaagcacc	300
tattacggcg	gtgattggta	tttcaacgtc	tggggcgcag	ggaccacggt	caccgtgagc	360
aagatctctg	gtggcggtgg	ctcgccggt	ggtgggtcgg	gtggcggcgg	ctcggtgggt	420
ggtgggtcgg	gccccggcgg	ctcgagccag	atcggtctgt	cgcagtcctc	agcaatcctg	480
tctgcatctc	cagggagaa	ggtcacaatg	acttgcaggg	ccagctcaag	tgttaagttac	540
attcacttgtt	ttcagcagaa	gccaggatcc	tccccaaac	cctggattta	tgcacatcc	600
aacctggctt	ctggagttccc	tgtcgctc	agtggcagtg	ggtctggac	ctcttactct	660
ctcacaatca	gcagagtgg	ggctgaagat	gctgccactt	attactgcca	gcagtggacc	720
agtaacccac	ccacgttcgg	tgctggacc	aagctggaga	tcaag		765

<210> 46
<211> 780
<212> DNA
<213> Streptomyces avidinii

<400> 46
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tcctgtgcag cctcaggatt cgatttcagt agatactgga tgagttgggt ccggcaggct 120
ccagggaaag ggctagaatg gattggagag attaatccaa ctagcagtagc gataaacttt 180
acgccatctc taaaggataa agtcttcate tccagagaca acgccaaaaa tacgtgtac 240
ctgcaaatga gcaaagttag atccgaggac acagccctt attactgtgc aagagggAAC 300
tactataggt acggagatgc tatggactac tgggtcaag gaacctcagt caccgtgagc 360
aagatctctg gtggcgggtgg ctcggggcggt ggtgggtcggt gtggcggcggt ctgggttggt 420
ggtgttatctc tgggacagag ggccaccatc tcatgcaggcc ccagcaaaag tgcgttac 480
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atctatcttg catccaaacctt agaatctggg gtccctgcca gggttcagtgg cagtggtct 600
gggacagact tcaccctcaa catccatctt gtggaggagg aggatgtgc aacattttac 660
tgtcagcaca gtagggagct tccattcacg ttccggctcggt ggacaaagtt ggaaataaaag 720
780